

This listing of claims replaces all prior versions and listings of the claims in the application.

In the Claims

1. (currently amended) A separation by ion implanted oxide (SIMOX) method of forming a buried oxide layer of a semiconductor-on-insulator ("SOI") substrate, comprising:
 - implanting, ~~at least one time~~, a base dose including oxygen ions at a first energy level into a buried region disposed below a major surface of a semiconductor substrate to form an oxygen-implanted region;
 - implanting, ~~at least one time~~, a second dose including at least one of oxygen ions or and-nitrogen ions into said oxygen-implanted region at a second energy level while maintaining said substrate at room temperature; and
 - annealing said substrate to cause said ions implanted by said steps of implanting said base dose and said second dose to be redistributed in said substrate and to react with a material of said substrate to form a buried oxide ("BOX") layer in said oxygen-implanted region, said BOX layer electrically isolating a semiconductor layer of said substrate disposed above said BOX layer from a semiconductor region of said substrate disposed below said BOX layer.
2. (previously presented) The method of Claim 1 wherein said semiconductor layer of said substrate disposed above said BOX layer consists essentially of single crystal silicon and said BOX layer includes silicon dioxide.
- 3-6. (cancelled)
7. (currently amended) The method of Claim 1, wherein said first energy level and said

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second energy level are in a range between about 40 KeV to about 240 KeV.

8. (previously presented) The method of Claim 1, wherein said second dose has a lower value than said base dose.

9-21. (cancelled)

22. (previously presented) The method as claimed in claim 1, wherein said second energy level is set lower than said first energy level by up to about 10%.

23-26. (cancelled)

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